

Occupation Pattern of Waterlogged People: A Study on the South-West Region of Bangladesh

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Abstract

Water logging hinders normal life of people and lowers their socio-economic status. Disruption of regular crop and fish cultivations compels farmers to pursue alternative crops and methods of cultivation to adapt with changes and to shift from their traditional occupations. Push factors are mainly responsible for waterlogged peoples' occupational changes. Unemployment, underemployment, and migration are three important consequences of water logging. Waterlogged people are trying to face these consequences through adjusting their occupation pattern. The adjustment process requires credit and training facilities. However, existing credit and training programs are insufficient and costly. Therefore, initiatives for providing sufficient credit and training facilities at favorable terms and conditions need to be taken by the government and NGOs immediately. However, permanent solution of the problem requires long-run planned initiatives to remove the logged water which will contribute to reverse the migration trend, reduce unemployment and underemployment, increase agricultural production and finally boost up income level.

Key Words: Water logging, Occupation, Migration, South-West Region, Bangladesh.

Introduction

Water is normally treated as a blessing for the human being. It saves human life. Water resource plays a significant role in economic development of a country. The resource contributes to agriculture and industry sectors of an economy. However, improper management of this resource may lead to enormous sufferings of the people and huge economic losses. Flood, unplanned dam and water logging are few examples resulting from miss-management of this important resource. This study defines water logging as permanent logging of water in a particular region for a long time. Both natural and man-made sources may contribute in creating water logging. It interrupts livelihood patterns of the people living in the concerned areas. It devours rice fields, disturbs normal agricultural activities, disrupts communication and makes the life of the people difficult for those who depend on agriculture and fishery to earn their living. As a result, people living in waterlogged areas are compelled to switch other occupations from original ones.

Literature Review

More than one third of the world's irrigated areas suffer from occasional or more frequent water logging (Donmann and Houston, 1967). Water logging reduces the potential yield of agricultural land (McFarlane and Williamson, 2002; Meyer and Barrs, 1988). Water logging problem of the study area (Abhaynagar upazilla of the south-west region of Bangladesh) has been getting worse over the time period. Many temporary waterlogged areas of 1980s are currently permanently waterlogged (Roy, 2007). AED (2006) also states that the waterlogged area has been expanding

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over the time period. Peoples' sufferings are increasing due to that expansionary trend. Getting easy access to safe drinking water is an ever challenging task for the waterlogged people (Action Aid Bangladesh, 2005). Water logging and similar other natural or man-made consequences undermine human security by reducing access to, and the quality of natural resources that are important to sustain livelihoods (Tutu, 2007a). Economic condition of the concerned people is also getting worse off. Increased unemployment and marginalization of farmers are the main consequences of expanded water logging situation in the region (BIDS, 1994).

Available literatures highlight on three important points of water logging. Firstly, identifying the causes of water logging; secondly, tracing the socio-economic impacts of water logging; and lastly, pointing out policy measures for solving the problem. However, the scope of this study is limited in concentrating mainly on the second issue, the socio-economic impacts of water logging. It tries to explore the occupation patterns of the waterlogged people which is merely absent in the available literatures. Occupation plays a vital role in daily life, living standard, social relationships, and economic strength of people. Occupation generates income that is the prime need to sustain. Therefore, occupation patterns and changes in occupation directly affect peoples' way of thinking, their socio-economic status, and concerned many other aspects. Similarly, changes in surrounding set-up of resources, policies, and practices finally affect occupation patterns of people.

Materials and Methods

The objective of this study is to trace out the consequences of water logging on occupation pattern of the people. This study is based on both primary and secondary data and information. Published books, journals, and organization reports are the main sources of secondary data and information. Questionnaire survey and face-to-face interview are the main sources of primary data. Authors have conducted questionnaire survey on 180 sample respondents of the Abhaynagar area using a well-structured and pre-tested questionnaire in January 2008. Special attention is given to explore true responses. Several face-to-face interviews are also conducted to get a clear picture about the research question.

The collected primary data and information are arranged, sorted and processed properly to address the research questions as specified in this paper. Attention is given to identify and exclude incomplete or biased information/data. Necessary mathematical and statistical tools are used to explain the collected information. Theoretical knowledge of available literatures is used to compare the findings of this study. Finally, the study tries to point out the special findings of the research that may be considered as the additions to the available literatures.

This study focuses on the south-west region of Bangladesh. It defines Khulna, Jessore, Satkhira and Bagherhat districts as the south-west region of the country (see Figure 1 and 2). Table 1 highlights important demographic features of the study area. However, due to time and other constraints, the study highlights only on the Abhaynagar upazilla of Jessore district among various water logged areas of the region. It tries to grasp the overall features of the water logged areas of the south-west zone of Bangladesh based on the survey findings on Abhaynagar. It may be mentioned here that among various regions, Abhaynagar is the worst affected area by water logging. Another limitation of the study is not covering all the people of Abhaynagar. However, the study follows a systematic random sampling procedure to cover representative people of various horizons. People from diverse income level, occupation, sex, educational qualification, family structure, socio-economic status and age are included in the samples.



Table 1: Demographic Features of the Study Area (Year 2001)

Region	Area (Sq. km.)	Household (No.)	Population			Literacy rate (%)
			Both sex	Male	Female	
Bangladesh	147570	25490822	124355263	64091508	60263755	46.2
Khulna Division	22285	3119482	14705229	7585999	7119230	48.6
Khulna District	4394	499324	2378971	1244226	1134745	57.8
Jessore District	2570	524127	2471554	1277650	1193904	51.2
Bagerhat District	3959	323505	1549031	804143	744888	58.7
Satkhira District	3858	390745	1864704	955198	909506	45.5
Abhaynagar Upazilla	247	50338	232162	120060	112003	53.5

Source: BBS (2007).

Results and Discussion

This study considers the south-west coastal region of Bangladesh to identify both short and long-run impacts of water logging on occupation patterns of the concerned people. The Coastal Embankment Project (CEP) initiated in 1960 by the then East Pakistan Government to protect the low land from intrusion of saline water initially boasted agricultural production (Alam, 2006; Mollah, 2005). However, the CEP disrupted the natural flow of river water within few years of its inception. River beds started to become higher and sluice gate became inactive due to silt deposition. Sequentially water logging appeared as a threat for the surrounding people. Initiated in 1980s, the severity of the problem has been increasing over the time period. The survey respondents of this study also mentioned the CEP as the rank-1 cause of water logging in the study area.

Khulna and Jessore are the mostly affected areas in this region for water logging. 35 unions of 7 upazillas of these 2 districts are currently waterlogged. Approximately 0.1 million hectares of land are under water and 0.92 million people are affected by water logging in these two districts (Mollah, 2005). Abhaynagar, Monirampur, and Keshobpur under Jessore district are the mostly affected upazillas of the region (Table 2). Vhabodah sluice gate mostly generated water logging in these three upazillas. Approximately 0.29 million people and more than ten thousand hectares of cultivable land of these three upazillas are waterlogged (*The Daily Prothom Alo*, September 06, 2006). Among these three, Abhaynagar upazilla of Jessore district is the mostly affected area. 46 villages of 4 unions and 1 pourashava of the upazilla are waterlogged due to locking of the sluice gates of Vhabodah. Approximately 4150 hectares of lands of 16 beels of Abhaynagar are currently waterlogged (AED, 2006). Around sixty-six thousands people of the upazilla are affected by water logging (*The Daily Prothom Alo*, September 06, 2006). This study is an attempt to trace out the occupation pattern of the waterlogged people of the south-west region of Bangladesh through investigating Abhaynagar.

Table 2: Overall Impacts of Water Logging in Khulna-Jessore Region

District	Affected Upazilla	Affected Union (No.)	Affected Area (hectare)	Household (No.)		People	
				Affected	Mostly affected	Affected	Mostly affected
Jessore	Monirampur	09	20629	36556	18278	201033	100530
	Keshobpur	07	24500	42109	21055	231630	115801
	Abhaynagar	04	9800	18318	9109	100753	50376
Khulna	Dumuria	08	23400	39259	19629	215925	107962
	Fultala	04	15200	18712	6356	102921	51461
	Doulatpur	02	8000	6909	3454	38003	19002
	Batiaghata	01	2000	4690	2345	25800	12900
Total	07	35	103529	166553	83226	916065	458032

Source: Mollah (2005).

Vhabadah sluice gate (Figure 3) mainly caused the water logging problem in Abhaynagar upazilla. Only around 1200 hectares of land were waterlogged at the beginning of 1980s that has increased to more than 4000 hectares currently in the area (Figure 4). That increasing trend of waterlogged area has caused redistribution of agricultural land. Number of rich farmers is declining but medium, small, marginal, and landless farmers are increasing (Table 3).

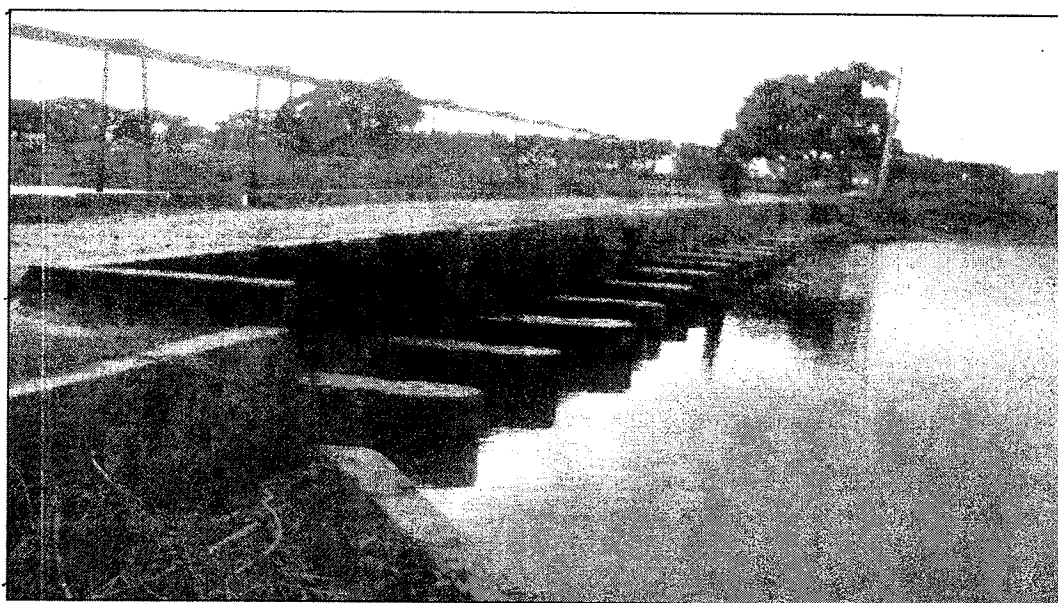


Figure 3: Vhabadah Sluice Gate

Source: Field Survey (January 2008).

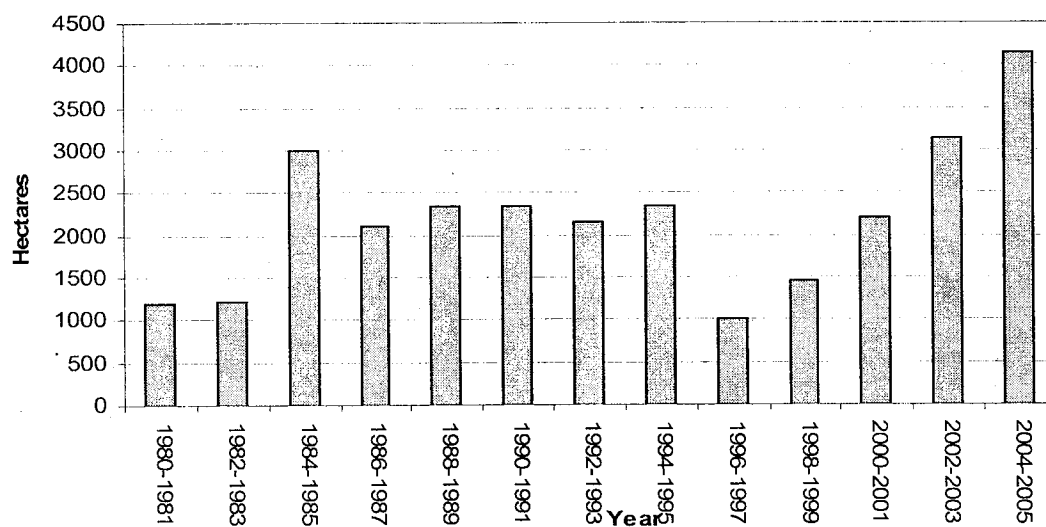


Figure 4: Waterlogged Land at Abhaynagar (Hectares)

Source: AED (2006).

Table 3: Waterlogged Farmer Family at Abhaynagar (Number)

Farmer Family		Large	Medium	Small	Marginal	Landless	Total
Union							
Prambag		54	303	683	2307	342	3716
Sundaly		52	400	730	1065	190	2437
Choliciya		61	586	1243	2408	1258	5556
Payra		137	607	929	1197	307	3177
Noapara (Pourashava)		84	647	1657	1390	640	4418
Total		304	2570	5242	8367	2737	19304
<i>N.B.:</i>							
Large Farmer Family		:	7.51 or above acres farm land;				
Medium Farmer Family		:	2.50 to 7.50 acres farm land;				
Small Farmer Family		:	1.00 to 2.49 acres farm land;				
Marginal Farmer Family		:	0.05 to 0.99 acres farm land;				
Landless Farmer Family		:	Less than 0.05 acres farm land.				

Source: AED (2006).

Abhaynagar was an agro-based area. More than 70% people of this region were dependent on agriculture until 1970s. Rice and fish were two main agro products (Mitra, 2001). The soil of this area was suitable for the production of rice, wheat, potato, jute, onion, flower, sugarcane, betel-leaf, and other agro products (Tutu, 2007b). However, the water logging problem emerged as a big threat for the agrarian economy since 1980s. Water logging captured huge cultivable land over time (Figure 4). Consequently, agricultural production declined over the time period (Figure 5). In addition, planned fish cultivation becomes difficult due to water logging. As a result, people completely dependent on agriculture had to rethink about their occupation. Currently, around 62%

people of the area are directly or indirectly related to agriculture. Moreover, the internal redistribution of occupation among the people related to agriculture is noteworthy. A trend of switching from crop production to fishing / fish cultivation is clearly visible among the surveyed people (Box 1). Push factors, such as, decrease in cultivable land, job scarcity and underemployment are more responsible than the pull factors, such as, job opportunity, higher wage and return behind such occupational changes. Survey results indicate that people who have switched from crop sector to fish sector are not in better position compared to their earlier position from economic viewpoint. They have to continue fishing / fish cultivation under mostly uncontrolled surrounding conditions caused by water logging. However, they are bound to change their principal occupation only to survive. Another visible change in occupation pattern is switching from farmer to laborer. Approximately one-fourth of the survey respondents are currently engaged as laborer. An insignificant portion is working as businessman or service holder (Field Survey, January 2008).

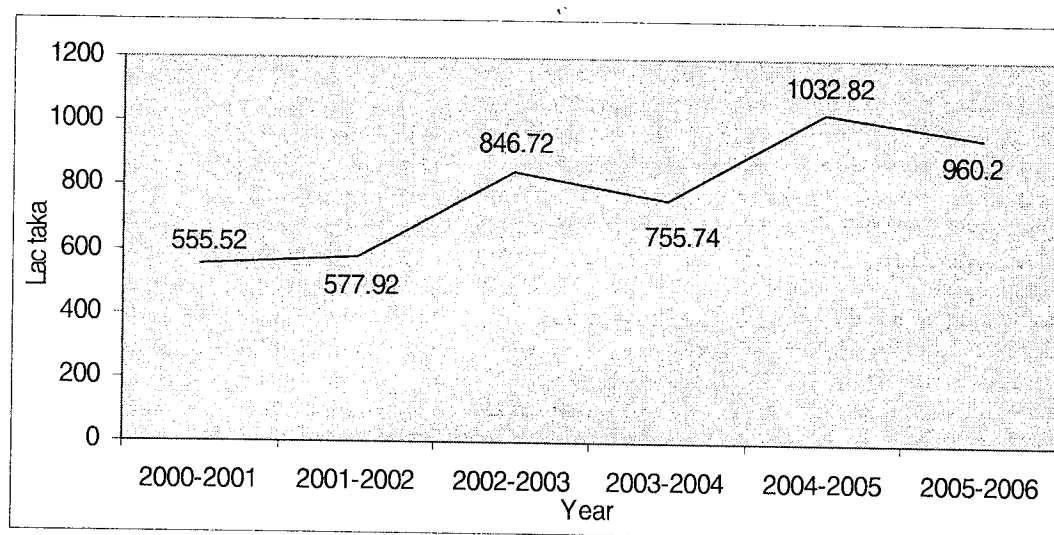


Figure 5: Loss in Agricultural Production at Abhaynagar (Lac Taka)

Source: AED (2006).

Box 1: Changes in Occupation Pattern

Jamsed Ali (50) was a rich farmer at Gabindopur village in Abhaynagar upazilla. He had cultivable lands before the period of water logging. He was in peace and happiness with eight family members. But currently his cultivable lands are under 5-6 ft. water. By losing his entire properties except homestead, today he becomes needy and helpless. Water logging has compelled him to change original occupation. To meet family expenditures he is now catching fish with other people, who once upon a time worked as day labor in his land (*The Daily Purbanchal*, November 06, 2006).

Narayan Biswas (62) and Vaghirothy Shikdar (48) of Vobanipur village were farmers. Currently, their paddy fields are under water, and they can't cultivate crops. As a result they have to search for new ways of livelihood. Now they are catching fishes in beel areas. Their average earning is around 100 taka per day which is sufficiently below to their earlier income level (*The Daily Prothom Alo*, July 16, 2006).

Family pattern also influences occupation pattern. Medium-sized (5-8 members per family), permanently living and nuclear type of family pattern dominate the study area. However, more than 90% families are single-headed. Such dependency generates extra pressures to the sole earning member of the family to adjust his/her occupation immediately for any change in income-expenditure pattern. Monthly income of the respondents is Taka 5398 for 5 family members on average. A majority of the respondents (around 60%) fall in Taka 3000-5000 per month income group. The amount itself is not sufficient to survive. Moreover, price hike of daily necessary goods and damage of agro-products for natural/man-made causes threaten their low level of income. Those people of lower income level group cannot afford even their basic necessities in many cases, let alone luxury goods. Field survey indicates that around 60% people of the area do not have access to electricity supply in their homestead, more than 50% people do have any access to recreation facilities like TV or radio, around 60% people do not have access to sanitary system, more than 20% people do not have access to pure drinking water and around 70% people do not have access to medical facilities in case of diseases. Low income level is the root cause behind the said realities (Field Survey, January 2008).

Job switch, job loss and underemployment are the main causes for comparatively low income level of the waterlogged people. Survey findings indicate that 80% people remain employed for 5-9 months per year on average. More than half of these employed people have to work less than 8 hours a day due to job scarcity. Such underemployment causes low level of income and consequently low living standard. Those underemployed people have been trying to change their occupation pattern through engaging in other income generating activities to utilize their idle time. Taking proper initiatives to properly utilize that idle time is very important which will ultimately increase their income level and living standard. Providing credit facilities at comparatively lower interest rate to initiate small business or to initiate alternative crop/fish cultivation adjusted with water logging tolerance may be short run solutions. Samad et al. (2001) describes the variation in water logging tolerance of agro-products. Small business, floating garden (locally known as *Dhap* or *Baira*), reed cultivation (*Mele* cultivation), cage aquaculture, crab cultivation, handicraft, net weaving, boatman and duck rearing are some specific examples. Many waterlogged people have been thinking to adjust their occupation pattern to such new dimensions subject to availability of sufficient credit facilities at comparatively low interest rate. As per the respondents' opinion, the existing 12-20% interest rate for loans from village *mohajons* (a local term which generally indicates the village landlords who give loans to local poor and middle class people at high interest rate) is very costly for them. In contrast to 80% underemployed people, the rest 20% can work all the year round covering mainly big farmers, service holders and businessmen. Many of them can even save after meeting their regular expenditures. Around 14% people save a portion of their income to various financial institutions. Their occupation and income are mostly stable and secured.

Table 4 below indicates that 62% respondents depend on agriculture and rest 38% depend on non-agricultural works like van pulling, rickshaw pulling, daily basis industry work, or small business. Average monthly income of agriculture occupation group is Taka 5239 and the figure is Taka 5659 for non-agriculture occupation group. The difference in the monthly average incomes of the two groups is not statistically significantly different from zero. Inclusion of few medium-sized businessmen in the non-agriculture group partially explains the income differences. However, underemployment of the agriculture occupation group is the main reason behind the said income discrepancies between the two groups. The non-agriculture occupation group works 1.33 hours more per day on an average compared to the agriculture occupation group, and the difference in working hours per day between the two groups is statistically significant from zero. Moreover, the non-agriculture occupation group works 2.94 months more per year on an average compared to the agriculture occupation group, and the difference in working months per year between the two

groups is also statistically significantly different from zero. Authors' investigation also indicates that hourly income is Taka 59 and Taka 45 for agriculture and non-agriculture occupation groups, respectively. In short, agriculture related peoples' total income is lower but per hour income is higher than the non-agriculture related people on average due to the prevailing underemployment situation in the waterlogged area. Investigation results clearly indicate that people traditionally engaged in or switched over to non-agricultural work are not in better position from economic viewpoint. Therefore, proper initiatives for solving the water logging problem will lead to stabilize the occupation pattern of the said traditionally agriculture dominated waterlogged area.

Table 4: Two sample t test results

	Group	Mean	Standard Deviation	Mean Difference	T-value	P-value
Monthly Income	A (N=112)	5239.18	8307.32	-		
	NA (N=68)	5658.82	4305.47	419.64	0.386	0.700 (NS)
Working Hours / Day	A (N=112)	7.49	2.13	-		
	NA (N=68)	8.82	2.07	1.33	4.11	<0.001 (S)
Working Months / Year	A (N=112)	6.77	1.02	-		
	NA (N=68)	9.71	2.32	2.94	9.86	<0.001 (S)
<i>N.B.:</i> A = Agriculture; NA = Non-agriculture. S = Significantly different between the means of the two groups at 5% level. NS = Not significantly different between the means of the two groups at 5% level.						

Source: Compiled by the Authors based on Field Survey (January 2008).

Migration is another dimension to explain changes in occupation pattern. Survey findings indicate that on average 11 people have migrated from every village of Abhaynagar upazilla in last ten years. The general reason of migrating for the hope of economic betterment is not so strong in this case. Rather they are somewhat forced to migrate finding no other alternatives to manage their living expenditure. Permanent migration is hardly found in the study area. The social bondage and lost harmonized social life may be the main reasons of not leaving the place permanently. In most of the cases people migrate alone to utilize their idle time and generate some extra incomes. The dominating trend is migrating to nearest city areas like Khulna and Jessore to work as rickshaw-pullers, van-pullers, daily-basis industry workers or shop-keepers. The earnings of these migrated people are used to meet family expenditure. Most of these migrated people want to stay at their paternal house as indicated by keeping their families there. However, water logging mainly forced them to migrate. Therefore, creation of income generating activities will lead to reduce the migration trend and bring happy family life and social harmony.

Water logging is pressing the people to change their occupation pattern. On the other hand, waterlogged people are facing various problems in coping with occupational changes. Availability of credit is the most significant factor. Waterlogged people faced difficulties in getting sufficient capital to adjust their occupation pattern with possible alternatives like floating garden, reed cultivation, cage aquaculture, crab cultivation, handicraft, net weaving, duck rearing or initiating small businesses. Another barrier to initiate and successfully continue these alternatives is lack of training. All of these alternative options are almost new to them which require proper training to accomplish successfully. Progoti Samajkallyan Sangstha (PSS), a NGO has been trying to provide credit and training on floating gardening, cage aquaculture, duck rearing, and handicraft making to the waterlogged people. However, the initiative is not sufficient to cover the whole waterlogged area. More NGOs need to come forward in this issue and Bangladesh government also need to

give special emphasis on providing credit and training to the waterlogged people to cope with occupational changes.

Conclusion

Water logging threatens food security, access to pure drinking water, housing, and income opportunities. It aggravates misery and adversity of the waterlogged people. It hinders normal life of people and lowers their social and economic status. The first visible impact of water logging is decrease in cultivable land and reduction of agricultural production. Consequently, agriculture dependent people become fatigued to meet their family expenditures and are compelled to change their occupations. Farmers are gradually becoming landless or small / marginal farmers over the time period due to water logging. The similar trend is found for people related to fishing. Push factors are mainly responsible for occupational changes.

Unemployment and underemployment are the main consequences of water logging. Agriculture dependent peoples' per hour average income is high but the average total income is numerically low (although not statistically different) due to underemployment. Migration is another important consequence of water logging. Waterlogged people are trying to face these consequences through adjusting their occupation pattern. Availability of credit and training facilities are the main constraints in adjusting occupation pattern. Existing credit and training programs are insufficient and costly. Therefore, initiatives for providing sufficient credit and training facilities at favorable terms and conditions need to be taken by the government and NGOs immediately. However, permanent solution of the problem requires further study and research for taking long-run planned initiatives to remove the logged water. Such initiatives will contribute to reverse the migration trend, reduce unemployment & underemployment, increase agricultural production and finally boost income level. All these will harmonize family life and bring social stability.

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